U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-454/84-54(DRSS); 50-455/84-37(DRSS)

Docket Nos. 50-454; 50-455 Licenses No. CPPR-130; CPPR-131

Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, IL 60690

Facility Name: Byron Station, Units 1 and 2

Inspection At: Byron Site, Byron, IL

Inspection Conducted: July 30 through August 1, 1984

Inspectors: L. J. Hueter — 8/28/84 Date

C. F. Gill — 8/28/84 Date

Approved By: L. R. Greger, Chief
Facilities Radiation
Protection Section — 8/28/84 Date

Inspection Summary:

Inspection on July 30 through August 1, 1984 (Reports No. 50-454/84-54(DRSS); 50-455/84-37(DRSS))
Areas Inspected: Routine, announced inspection of preoperational radiation protection program for Units 1 and 2. The inspection included organization, staffing, training, radiation protection procedures, facilities, instruments, status of certain NUREG-0737 items, a review of HEPA/Charcoal filter housing drain systems, and review of drain provisions for both valve stem leak-off and instrument racks. The inspection involved 49 inspector-hours on site by two NRC inspectors.
Results: No items of noncompliance were identified.

DETAILS

1. Persons Contacted

P. Anthony, Technical Staff
*S. Baros, Nuclear Services
*J. Bartleman, Systems Test Engineer
*W. Blanford, PED
*P. Boyle, PED
*W. Burkamper, QA Supervisor, Operations
*R. Coley, Corporate Supervisor, Chemistry and Radwaste Services
J. Delhotal, Instrument Foreman
*T. Didier, Master, Instrument Maintenance
*D. Eggett, SNED-R&DE Group
*D, Elias, PED
*D. Farrar, Director, Nuclear Licensing
*P. Garnier, SNED
M. Graham, Technical Staff
D. Herrmann, Chemist
*L. Johnson, QA Engineer
*G. Klopp, PED
*G. Nichols, Chemical Engineer/TSN
K. Passmore, Ventilation Group Leader
*R. Poche', Tech Staff, Licensing
D. Prisby, Systems Test Engineer
*R. Querio, Station Superintendent
*F. Rescek, Nuclear Services
*D. St. Clair, Technical Staff Supervisor
*V. Schlesser, Project Manager/Byron
*A. Scott, Health Physicist
A. Selep, Systems Test Engineer
W. Smith, Systems Test Engineer
*B. Stephenson, Manager of Production
*L. Sues, Assistant Supervisor, Maintenance
*K. Weaver, Station Health Physicist
T. Weis, PED
*P. Wicyk, PED

W. Bowman, ALARA Coordinator (Consultant)
*D. Kozin, Rad/Chem Staff (Westinghouse)
*E. Kaczmarski, Control and Instrument Division (S&L)
*G. Sensmeier, Sr. Project Engineer - CIP (S&L)
D. McQueen, HVAC Project Engineer (S&L)

*W. Gammill, NRC/NRR
*R. Greger, NRC/RIII
*J. Hayes, NRC/NRR
*J. Hinds, Jr., NRC/Senior Resident Inspector
*C. Paperiello, NRC/RIII

*Denotes those present at the exit meeting.

2. General

This preoperational inspection, which began about 1:00 p.m. on July 30, 1984, was conducted to examine aspects of the preoperational radiation protection and radwaste programs, certain systems demonstrations and tests, filter housing drain systems, drain provisions for both valve stem leak-off and instrument racks, and progress made on certain NUREG-0737 items. The inspection included tours of the turbine building, auxiliary building, primary containment, and radwaste building.

3. Organization, Staffing, and Training

The inspectors reviewed the respiratory protection program.

The guard force has now completed initial respiratory fit testing, medical evaluations, and training in respiratory usage. Review of data by the licensee indicated a need to redo the fit testing for about 25 guards. According to licensee personnel, this fit testing has been completed (August 22, 1984, telecon). The licensee provided the 30-day notification to the NRC pursuant to 10 CFR 20.103(g) by letter dated August 14, 1984. Open Item 454/84-10-03; 455/84-08-03 is closed.

4. Radiation Protection Procedures

The inspectors reviewed the status of the offsite dose calculation manual (ODCM).

On July 2, 1984, the licensee submitted Revision 11 of the Byron ODCM as a partial response to NRR's review of a previous ODCM submittal. Revision 11 was intended to incorporate changes necessary to address NRR questions regarding the Byron site specific portion of the ODCM. The covering letter of the July 2, 1984, submittal stated that other NRR questions considered by the licensee to be generic to all CECo ODCMs would be addressed in a generic CECo ODCM revision to be issued by the end of 1984. An NRR representative at the exit meeting indicated that the licensee had not responded to all of NRR's questions relating to Byron. The licensee stated the matter would be pursued and any additional information needed would be provided.

Items remaining to be completed in this area include NRR's final review and approval of the ODCM. Open Item 454/84-10-04; 455/84-08-04 remains open.

5. Facilities, Instrument, and Equipment

The inspectors reviewed the status of installation of laundry and respiratory equipment facilities; installation of portal monitors; and review of area monitor calibration data.

Construction of the laundry facility and installation of major equipment has just been completed and turned over to the station. The licensee plans to have the laundry facility furnished with table, carts, supplies, etc., and the flow path established in readiness for operation by August 15, 1984.

Construction of the respiratory protection equipment cleaning, maintenance, inspection, and issuance facility has also recently been completed and turned over to the station. Equipment is operational and storage shelves are in place. The licensee plans to stock respirators, smoke test units and other supplies in the room and to complete some training on the function of the facility in preparation for operability by August 10, 1984.

All eight IRT portal monitors are now on site and physically in place. Four are located at the security building exit; two are located at the exits from the auxiliary building to the turbine building at the 401 and 426 foot elevations; one is located at the 426 foot elevation exit to the unprotected area from the Unit 2 containment and fuel handling building; and the last one is located at the radwaste building exit (401 foot elevation). Instrument maintenance technicians were recently given, by an IRT representative, four days of training in servicing and calibrating the portal monitors. Two controller units are still needed (on order) and the two portal monitors involved will need to be recalibrated. The licensee still plans to have all eight portal monitors calibrated and operational three weeks before fuel load.

As noted in Inspection Report No. 50-454/84-10; 50-455/84-08, all area monitor detectors, both GM and ion chamber types, were calibrated with either a cesium-137 or cobalt-60 primary source (NBS traceable) at General Atomic before being delivered to the licensee. After installation at the plant, the response was verified to be within ±15% at two different exposure rates using a double ended cesium-137 source which has been cross calibrated to the primary source. The cross calibration data received by the licensee from General Atomic will be reviewed during a future inspection. Records of detector type calibration and individual detector electronic calibrations, permitted for upper ranges of the containment high range monitors, will also be reviewed during a future inspection. Correlation of the response of the high range containment monitors to containment gases is by a licensee developed computer code. Review of containment high range radiation monitors is discussed in Section 8.

Items remaining to be completed in this area include: furnishing and stocking the laundry facility, stocking the respiratory protection equipment facilities and completion of training regarding use of the facility; operability of the eight portal monitors; and review of area monitor calibration data. Open Item 454/84-10-05; 455/84-08-05 remains open.

6. Process and Radwaste Effluent Monitors

The inspectors reviewed plans for fluid (gas and liquid) calibration/linearity checks of monitors during startup and determined the status of installation and in-place testing of HEPA and charcoal filters in various filter trains.

The licensee continues to plan the performance of fluid (gas and liquid) calibration/linearity checks of monitors during startup to correct shortcomings of the interim calibration checks identified in Inspection Report No. 50-454/84-10; 50-455/84-08.

Installation and in-place testing of HEPA and charcoal filters has not begun but a licensee representative stated that testing is planned to begin within a week or two. By NRR letter dated December 22, 1983, the licensee has some relief for completion of in-place filter testing on three vent systems. For the control room vent system, one train must be tested by fuel load and the second by initial criticality. The containment purge system must be tested prior to five percent power operation. For the auxiliary building ventilation system (accessible areas, nonaccessible areas, and fuel handling building) in-place filter testing is not required until after initial criticality and Unit 1 can be operated for an equivalent 10 full power days, at 25 percent power or less. Vent systems that have no relief and are apparently required to be tested by fuel load are off gas, TSC, radwaste and remote shutdown, filtered vent system, containment ventilation, and chemistry laboratory (HEPA filters only).

Items remaining to be completed in this area include fluid (gas and liquid) calibration/linearity checks of monitors during startup, and installation and in-place testing of HEPA and charcoal filters in various filter trains. Open Item 454/84-10-06; 455/84-08-06 remains open.

7. Preoperational Systems Demonstrations and Tests

a. Status of Previously Reviewed Demonstrations and Tests

(1) OG 2.55.20 Off Gas

Although licensee Deficiency OG 8865 regarding in-place filter testing of charcoal and HEPA filters in the off gas filter train remains open pending completion of testing, it will no longer be tracked here as it is included in Open Item 454/84-10-06; 455/84-08-06, as noted in Section 6.

(2) GW 2.38.10 Radioactive Waste Gas

In Inspection Report No. 50-454/84-10; 50-455/84-08, Unresolved Item 454/84-10-02; 455/84-08-02 was identified concerning the adequacy of a licensee review of an engineering design change which resulted in the bypass of an isolation valve on the waste gas exhaust line. During this inspection the inspector reviewed Revision S to P&ID M-69 designed to eliminate the bypass. The inspector concurs that the revision provides the means to eliminate the bypass. Further, the inspector observed that the modification has been installed as shown on the revised P&ID. However, as noted in interim Inspection Report No. 50-454/84-33; 50-455/84-26, Unresolved Item 454/84-10-02; 455/84-08-02 will remain open pending completion of the resident inspectors' review

of the adequacy of the licensee's Engineering Design Change Review for the original modification which resulted in the bypass problem. Resolution of the item will be covered in a future inspection report by the resident inspectors.

(3) WX 2.106.20 Radwaste Reprocessing Tanks and Pumps

Deficiencies WX 3344 and WX 3345, involving installation of level indicators on the spent resin storage tank, have been completed except for functional demonstration. Deficiencies WX 3341 and WX 3342, involving current load testing of pumps, are still open, but the activity will be completed at the same time as the functional demonstration of the level indicators. Licensee personnel stated that action on all four of these deficiencies should be completed and the deficiencies closed before fuel load.

(4) AR 2.06.10 Area Radiation Monitors

The one deficiency of significance identified by the licensee in the test to demonstrate proper operation of RM-11 software, remains open. Deficiency AR 11356 (scheduled by the licensee for completion by fuel load) involves an RM-11 problem in re-establishing all communications with individual monitors in the currently allotted time following a bootstrap operation. The licensee stated that General Atomic is working on an additional software modification to permit automatic retrieval of communications with all monitors following a bootstrap operation. Although it can now be done, it has to be done manually.

(5) AR 2.06.11 Area Radiation Monitors (Loop 1)

This deficiency was transferred to an Action Item Record (AIR) and is being tracked by the licensee under that system. AIR 6-84-011 involves preoperational testing of area radiation monitor IRT-AR025, IRT-AR026, and IRT-AR027 and associated equipment after equipment and monitors are installed and calibrated. These supplemental monitors are high range area monitors considered necessary following issuance of Regulatory Guide 1.97, Revision 2 (issued December 1980), in order to satisfy post accident considerations. These monitors, which will be installed near containment penetration areas, have been ordered and are expected to arrive about September or October 1984. Following receipt of equipment, installation and calibration, preoperational testing will take place and is expected by the licensee to be completed after Unit 1 fuel load but before the first refueling.

(6) PR 2.60.12 Process Monitors (Loop 2)

All four deficiencies scheduled by the licensee for completion by operational Mode 4 remain open. Deficiencies PR 8857 (now tracked as CWR PR-007) and PR 10754 (now tracked as CWR PR-008) involve a problem whereby operation of certain PR skids will cause the normal sample panel to be isolated from Unit 1 steam generator blowdown and then will not permit de-isolation. A design change to permit de-isolation has been installed but not yet tested. The other two deficiencies, Deficiency 10656 (now tracked as CWR PR-006) and Deficiency 11219 (now tracked as CWR PR-005) are both expected to be corrected by an RM-80 software change being prepared by GA which was expected to be installed in late June but had not arrived as of the inspection date. Deficiency 10656 involves PR detectors with background channels which, under certain combinations of failures and conditions, may cause rapid toggling of interlock status, resulting in multiple alarms. Deficiency 11219 involves PR integrating channels (iodine and particulate detectors) for which radiation levels will change by a factor of about three when the pump is first turned on and off which may result in spurious high radiation alarms and/or interlock alarms. This problem is believed caused by the way certain calculations are made in the RM-80 software.

(7) PR 2.60.13 Process Monitors (Loop 3)

Deficiency 10071 (scheduled by the licensee for completion by fuel load) involves spurious noise signals above alarm/ interlock set points of PR detectors. The licensee expects to receive soon a GA supplied modification for noise suppression associated with relay contact closures. Following receipt and installation, a test will be run to assure that the modification solves the spurious noise signal problem.

(8) PR 2.60.16 Process Monitors (Wide Range Gas Monitors

All six deficiencies (scheduled by the licensee for completion by operational Mode 5) remain open. Three of the deficiencies are expected to be corrected by the RM 80 software change, being prepared by GA, which was expected to arrive in late June but still has not arrived. These three are Deficiency 12381, involving failure of a pump to restart following a power failure; Deficiency 12665 involving a loss of counts after a power failure; and Deficiency 12666, involving a problem with software cycling on "instrument failure alarm." The other three deficiencies have been assigned to PED and resolution of the problems are in progress. These three are: Deficiency 10866, involving a possible nonconservative release rate calculation due to the off gas exhaust system entering the vent system down stream of the flow transducer from which data is used to calculate release rate; Deficiency 10865, involving piping installed with long horizontal runs and upward slopes (contrary

to vendor recommendations) which may cause particulate deposition (plate out) and nonrepresentative samples at the skid; and Deficiency 10872, involving sharp bends in the inlet piping for low range samples which may result in particulate deposition (plate out) and nonrepresentative samples at the filter and grab sample container. Some additional problems with the wide range gas monitor system, other than those noted by the licensee, are discussed in Section 8.

(9) WX 2.106.22 Radwaste Demineralizers and Filters

Deficiency 11051 (scheduled by the licensee for completion by operational Mode 2) involves acid feed dump AC04P which has insufficient head for regenerating resins. As a corrective measure the pump impeller has been replaced. The component demonstration test procedure has now been written and approved but the deficiency remains open pending the successful testing of the pump.

(10) WX 2.106.21 Radwaste Evaporators

The numerous (about 40) licensee identified deficiencies remaining open at the time of the last inspection, conducted in late May 1984, have now been slightly reduced to about 33. The licensee still states that, for many of the problems, corrective work has been completed with only the functional tests remaining to be completed. All deficiencies are scheduled for completion by initial criticality.

(11) WX 2.106.23 Stock Equipment

The numerous (about 27) licensee identified deficiencies remaining open at the time of the last inspection, conducted in late May 1984, have been reduced to 15, none of which appear to be of significance. All fifteen deficiencies are scheduled to be completed by low power testing. The system consists of two identical units. Satisfactory testing of the B Unit is virtually complete. No significant problems are expected in completion of the A Unit.

(12) PS 2.61.10 Post-Accident Sampling System

Licensee identified system deficiencies are now being tracked as Construction Work Records (CWRs). About 36 PASS CWRs remain open of which approximately one half have the potential for being significant. Most of the existing serious deficiencies are problems with pressure and flow indicators, valve malfunctions, and leaky isolation valves. In addition, there are such problems as heat trace circuit difficulties and clogged drains. For some of the deficiencies, corrective work has been completed with only functional tests remaining to be completed. The inspectors verified that the deficiencies are being tracked by

the licensee. Several problems other than those noted by the licensee were identified during the inspectors' review of this system, and are discussed in Section 8.

b. Status of Demonstrations and Tests not Previously Reviewed by Inspectors

PR 2.60.15 Process Monitors (Loop 5)

This test has been completed and reviewed by the licensee. Two licensee identified deficiencies appearing to be of significance remain open. Both deficiencies, Deficiency 12815 and Deficiency 12816, involve redoing the flow section steps of certain tests where flow was inadequate. Some modifications were made (rerouting of piping) to correct the problem but the test steps have not yet been redone to verify proper flow. Both of these deficiencies (scheduled for completion by fuel load) are now being tracked by the licensee under AIR 6-84-176. No problems other than those noted by the licensee were identified during the inspectors' review.

According to licensee personnel, the following systems demonstrations and tests are at the percentage completion indicated:

PR 2.60.10	Process Monitors	75%
VR 2.135.20	Aerojet VR System	0%
VR 2.135.21	Stock Polymer Solidification System	0%

At the time of the last inspection, conducted in late May, it was noted that the licensee had increased the priority on completion and operation of the volume reduction (VR) facility. It was noted that Aerojet planned to start-up the unit about mid-July for "fine tuning" (estimated to take four to six weeks) following which the facility would be turned over to the licensee for systems demonstration testing. However, start-up has been delayed an estimated four weeks to mid-August while adding insulation as the original heat tracing design was not adequate. One of the fluidized beds was recently heated up to 1200°F during a trial heatup. It is now estimated that the VR facility will be turned over to the licensee for systems demonstration testing by mid-September at the earliest. Revision 2 of the preoperational test is in the final review stage.

Work is progressing on the Stock Polymer Solidification System for solidifying ashes and salts from the VR facility into 55-gallon drums using a DOW Polymer as the solidifying agent. The Stock microprocessor unit which controls the solidification process is not expected to be ready until September 15, 1984. The preop test for this unit has been drafted and is in the initial review stage.

Items to be completed in this area include preoperational testing of some systems; post-test evaluations of some systems; and resolutions of deficiencies identified by the licensee during preoperational testing of

area monitors, process and radwaste effluent monitors, and gaseous, liquid, and solid radwaste systems. Open Item 454/84-10-10; 455/84-08-10 remains open.

8. Status of Certain NUREG-0737 Action Items

The description of licensee actions in response to the TMI action items are provided in the FSAR, Appendix E.

a. NUREG-0737 Item II.B.3, Post-Accident Sampling System

Section E-21 of Appendix E describes the post-accident sampling system for reactor coolant and containment atmosphere. The system is a modified Sentry high radiation sampling system (HRSS) consisting of three subsystems: the liquid sample panel (LSP), the chemical analysis panel (CAP) which is attached to the LSP, and the containment atmosphere sample panel (CASP).

The preoperational test (PS 2.61.10) of this system is discussed in Section 7 of this report. In addition to the deficiencies found by the licensee during and since preoperational testing, the inspectors noted several potential problem areas during a tour of the system; they are discussed in Inspection Report No. 50-454/84-33; 50-455/84-26. Licensee progress in addressing these additional deficiencies is described below.

The status of inspector previously identified PASS deficiencies is as follows: (1) if licensee decides not to borate the Reactor Coolant to the presently anticipated level of approximately 2000 ppm during hot operational testing, current plans are to develop an alternative chemical method to calibrate the LSP dilution system; (2) the problem with the position indication for the HRSS demineralized water to volume control tank valve 1PS201 has been identified as a leaky air regulator which remains uncorrected, but is being tracked by Construction Work Record, CWR No. PS-0056; (3) the licensee expects the requested thermal analysis of the CASP sample line, to determine the type of heat tracing and thermal insulation required, to be completed by Sargent & Lundy about August 17, 1984; (4) depending on the results of the Sargent & Lundy thermal analysis, the inspectors may still recommend the heat tracing on the CASP sample line be extended to the sample collection location and that licensee deficiency number 12523, on this matter, be re-opened; (5) the licensee was informed by the inspectors during the exit meeting that it was the NRC's position that the licensee should proceed with empirically determining the CASP sample line loss correction factors for iodine and particulates or provide adequate justification for not doing so; (6) a work request has been submitted to modify and correct the CASP process monitoring panel display diagram; (7) licensee representatives provided the inspectors with a copy of a letter from Sargent & Lundy to Commonwealth Edison Company, dated May 8, 1984, which states that the CASP valving modifications (and thus the heat tracing modification) can be delayed until at least the first full outage on Byron Unit 1; (8) if the CASP valving modification is not required before five

percent power, lines PR45A, PR46A, and PR49A could represent significant post-accident sources and should be factored into the NUREG-0737 required detailed time and motion dose study to determine if it is possible to obtain and analyze reactor coolant and containment atmosphere samples without radiation exposures to any individual exceeding the GDC-19 dose criteria (5 rem whole body and 75 rem extremity); (9) the May 8, 1984, Sargent & Lundy letter states that the limit established by Commonwealth Edison for collecting post-accident samples is 1.0 rem rather than the 5 rem whole body limit of GDC-19; (10) to accommodate inspector concerns about the possible existence of noble gas in the vapor space of liquid samples, the licensee agreed to revise Procedure BCP 800-8, "Dilution Criteria - Post Accident Isotopic," Revision 0, by requiring the dilution deionized water to be added by a syringe through a septum rather than by pipet with the sample vessel cap removed; (11) HRSS training was scheduled to be completed on August 1, 1984, and licensee representatives stated that the associated training documentation will be ready for review within a few days; (12) all retest and operation procedures are written but not all are approved; (13) the new throttle valves and flow meters, which were installed to correct the LSP system failure to obtain proper flow from radwaste sample locations, are scheduled to be tested by September 1, 1984, as part of the hot operational test; and (14) all other retests are also scheduled to be completed by September 1, 1984.

Items to be completed in this area include: (1) LSP dilution system calibration; (2) HRSS demineralizer water to volume control tank valve 1PS201 position indication correction; (3) CASP heat tracing justification or modifications; (4) determination of CASP sample line loss correction factors for iodine and particulates; (5) correction of the CASP process diagram display; (6) elimination by design or procedure of potentially significant post-accident source terms represented by CASP sample station area CAMs including the CASP system CAM, 1PR11J (and 2PR11J); (7) procedures incorporating the radiation protection aspects of handling significant airborne activity in a liquid sample vial post-accident; (8) correction of the LSP system to obtain design basis sample flow; (9) HRSS training; (10) retest and operation procedure approvals; (11) system retests; and (12) detailed time and motion dose study for obtaining and analyzing reactor coolant and containment atmosphere samples. Open Item 454/84-10-07; 455/84-08-07 remains open.

b. NUREG-0737 Item II.F.1.1, High Range Noble Gas Effluent Monitors

The accident range noble gas effluent monitoring system consists of a General Atomic Wide Range Gas Monitor (GA WRGM) for the auxiliary building vent, and area monitors (compensated for loss of low energy gamma radiation) mounted external to each of the four main steam lines upstream of the safety and relief valves. Installation is complete for both systems. The preoperational tests for the area monitors on the main steam lines (Preoperational Test AR 2.6.11) and the wide range gas monitors (Preoperational Test PR 2.60.16) are complete and are discussed in Section 7. In addition to the deficiencies found by the licensee during preoperational testing, the inspectors noted

several potential problem areas during a tour and review of the system; they are discussed in Inspection Report No. 50-454/84-33; 50-455/84-26. Licensee progress in addressing these additional concerns is described below.

Licensee responses to inspector identified concerns with the accident range noble gas effluent monitoring system include: (1) a draft Sargent & Lundy report released about July 27, 1984, reportedly replaces the Sargent & Lundy preliminary procedure dated October 21, 1983, for converting the main steam level (MSL) monitor readings to the specific activity of the steam; (2) a licensee representative stated that justification would be presented to the inspectors for extending the MSL monitor conversion factor curve to a specific terminus post-shutdown time; (3) the concern with the MSL monitor NUREG-0737 concentration display requirement is still unresolved pending licensee decision on the integration of MSL monitor readout into the GSEP off-site dose assessment scheme; (4) a station procedure for converting MSL monitor readings into release rates awaits the development of a station procedure to determine concentration as a function of monitor reading and time post-shutdown; (5) a licensee representative stated that the GA WRGM system is not scheduled to appear on the Equipment Qualification List until December 1984; (6) the licensee committed to correct Section E.30 of Appendix E to the FSAR such that it is clear that the gaseous grab sample capability discussed therein is not a design function of the GA WRGM system; (7) a letter specification is reportedly being drafted to establish WRGM calibration techniques and procedures to meet the energy dependence criterion of Clarification (4)(b), Item II.F.1, Attachment 1, NUREG-0737; (8) licensee representatives concurred that the use of gaseous grab samples would need to be utilized in conjunction with assumed radionuclide distribution as a function of time after shutdown to obtain consistently conservative estimations of concentration, release rate, and off-site dose rate; (9) GA reported to the licensee that the WRGM Units installed at Byron have been upgraded to correct the deficiencies discussed in the July 22, 1983, GA letter from J. H. Winso to J. E. Wigginton (NRC, IE); (10) the licensee committed to obtain documentation from GA verifying the deficiency corrections for the Byron WRGM units and to make those documents available for inspector review; (11) the WRGM isokinetic maintenance feature and flow rate display concerns remain unresolved pending licensee decision on integration of the monitor readout into the GSEP off-site dose assessment scheme; (12) the licensee committed to obtain documentation from GA to verify that the WRGM system is designed to compensate properly for reduced pressure, even with fully loaded filters; (13) a Sargent & Lundy thermal analysis of the WRGM sample lines was projected to be completed by August 17, 1984; (14) this study is to determine the type of heat tracing and thermal insulation required, the need to heat the sampler to maintain the sample media well above the dew point, and if any changes are required in sample line configuration; (15) the evaluation of the four technical parameters delineated on page 15 of Inspection Report No. 50-454/84-33; 50-455/84-26 awaits WRGM calibration and procedures to meet the energy dependence criterion of Clarification (4)(b), Item II.F.1,

Attachment 1, NUREG-0737; and (16) station procedures and personnel training program development await resolution of the accident range noble gas effluent monitoring system technical concerns.

Items to be completed in this area include: (1) MSL monitor display modification, procedures, and training; (2) wide range gas monitor (WRGM) equipment qualification review, calibration, sample chamber pressure compensation review, heat tracing review, sample line design review, setpoint review, NUREG-0737 II.F.1.1(4)(b) detector assembly response curve development, detector range re-evaluation, document acquisition, display modification, procedures, and training. Open Item 454/84-10-08; 455/84-08-08 remains open.

c. NUREG-0737 Item II.F.1.2, Sampling and Analysis of Iodine and Particulate Effluents

The accident range iodine and particulate effluent sampling system is a part of the General Atomic system described above for Item II.F.1.1 and provides for obtaining grab samples from the auxiliary building vent and subsequent analysis of samples using facilities in the counting room or in an auxiliary counting set-up in the turbine building. Preoperational testing of this system (a part of Preoperation Test PR 2.60.16) are completed and are discussed in Section 7. In addition to the deficiencies found by the licensee during preoperational testing, the inspectors noted several potential problem areas during a tour and review of the system; they are discussed in Inspection Report No. 50-454/84-33; 50-455/84 26. Licensee progress in addressing these additional concerns is described below.

The status of inspector previously identified concerns with the accident range iodine and particulate effluent sampling system is as follows: (1) during the exit meeting, NRR stated positions on certain NUREG-0737 items were that Byron should empirically predetermine sample line loss correction factors due to iodine plateout and particulate deposition, should use the NUREG-0737 design basis shielding source term of 100 µCi/cc of gaseous radioiodine and particulates deposited on sampling media for 30 minutes with an average energy o 0.5 Mev, and should heat trace the sample lines, as necessary; (2) also during the exit meeting, the licensee was reminded that they must formally request deviations from NRR for exceptions to NUREG-0737 Items; (3) the licensee has not made significant progress on addressing the nine previously identified inspector concerns with sampler design specifics; (4) because of the previous uncertainty associated with defining the proper sample design basis shielding source term, the licensee has not yet performed a detailed time and motion study to determine if the GA WRGM high range system iodine and particulate filters could be collected without exceeding the GDC-19 dose criteria (5 rem whole body and 75 rem extremity); and (5) station procedure and personnel training program development await resolution of the accident range iodine and particulate effluent sampling system technical concerns.

Items to be completed in this area include: (1) sample line loss correction factors determination; (2) shielding source term criteria development; (3) sample line heat tracing and installation detail design work; (4) analyses of sampler design specifics; (5) time and motion dose study; (6) station procedures; and (7) personnel training. Open Item 454/84-10-01; 455/84-08-01 remains open.

d. NUREG-0737 Item II.F.1.3, Containment High Range Radiation Monitors

The containment high range monitors have been installed, calibrated and preoperationally tested (Preoperational Test AR 2.6.11). As noted in Section 5, review of electronic calibration data, source calibration data, and cross calibration data remains to be completed. The review of the preoperational test is presented in Section 7.

During a plant tour, the inspectors noted that the placement of these monitors was such that the polar crane was partially shielding both detectors. The location of the containment high range radiation detectors is shown in Figure E.30-1 of Appendix E to the FSAR. The placement of these detectors is the same for both units. It appears that these detectors are not installed to meet the NUREG-0737 requirement which specifies that the monitors are to be located in containment such that they view a large segment of the containment atmosphere. NUREG-0737 also states that the monitors should not be placed in areas which are protected by massive shielding and should be reasonably accessible for replacement, maintenance or calibration. It appears that these NUREG-0737 criteria are also not met. It would be difficult to obtain reliable information from these monitors because their effective sensitivity and monitored region depends upon the position of the polar crane. Either the present locations of these detectors should be justified or the installation location altered to more closely comply with NUREG-0737 criteria.

Items remaining to be completed in this area include: (1) review of calibration data for the containment high range radiation monitors; and (2) monitor relocations to comply with NUREG-0737 criteria or justification of their present location. Open Item 454/84-10-09; 455/84-08-09 remains open.

9. Filter Housing Drain Systems

Inspection Report No. 50-454/84-33; 50-455/84-26; delineated a number of specific inspector concerns with the HVAC filter housing drain systems. The licensee response to those concerns is discussed below.

During this inspection, the licensee committed to reroute the TSC emergency makeup air filter housing drain discharge to the radwaste system. However, a specific completion date for this activity had not been scheduled. A licensee representative stated that manual isolation valves have been added to the drain lines for this system. The licensee agreed to supply the inspectors with documentation of the installed valves' air leaktightness

and to develop administrative procedures to ensure that the valves are maintained closed except when required to properly serve their intended function. A licensee representative called the inspectors on August 20, 1984, and stated that a detailed study of drain system drawings and a walk down of the drain system shows that the TSC emergency makeup air filter housing drain discharges to the laundry drain tank (a monitored release pathway) rather than to the low conductivity sump (an unmonitored release pathway) as was indicated to the inspectors during a previous inspection (50-454/84-33; 50-455/84-26). Verification of the valve additions and verification that the TSC emergency makeup air filter housing drain discharges via a monitored release pathway will be reviewed during a future inspection.

A licensee representative stated that the same make and model water check valve is used in all station HVAC filter housing drain lines and that the characteristics of this valve type are such that it provides an air tight barrier for filter housings under negative pressure. Such performance would resolve inspector concerns with the Control Room emergency makeup air system filter housing drain lines. The licensee agreed to supply the inspectors with vendor documentation on the subject valve including air leakage rate as a function of pressure, details of the closure mechanism, and design activation pressure settings for valve opening and reseating. A licensee representative stated that the filter housing drain lines which contain check valves are left unplugged during housing leakage tests and that these tests, thus far, have demonstrated the housings, including the check valve pathway, are virtually air tight. The vendor valve documentation and the results of the filter housing leakage tests will be reviewed during a future inspection.

The offgas filter housing is also under negative pressure, but the inspectors still have concerns with the drain system valving arrangement (valves in series on a common drain header). Pending receipt and review of vendor valve documentation, these concerns remain unresolved.

The licensee has made some progress with the requested station-wide survey of filter housing drain systems. A licensee representative stated that most of the individual installed station filter housing drain system arrangements had been field checked for proper design and that the station ventilation group would be walking down each drain system discharge pathway to ensure that it is properly routed to the radwaste system and in agreement with the appropriate P&IDs. Thus far, the licensee has found no problems other than those previously noted by the inspectors. The final list of systems and P&IDs examined and the licensees findings will be reviewed during a future inspection.

In discussion with licensee representatives, the inspectors clarified that the concerns with routing the filter housing drain lines to the floor drains was based on ALARA considerations (not NUREG 0737). The design concept of routing the drain lines of each filter housing to open funnel floor drains was discussed with licensee representatives but the licensee did not commit to this design change. The status of this ALARA concern will be reviewed in a future inspection.

Items to be completed in this area include: (1) verification that suitable manual isolation valves have been added to TSC emergency makeup air filter housing drain lines; (2) obtaining adequate documentation on these TSC valves to ascertain their air tightness quality; (3) development of administrative procedures to ensure that these TSC valves are maintained closed except when required to properly serve their intended function; (4) obtaining adequate documentation on the water check valves used in station filter housings to determine if they are suitable for their intended purpose; (5) verification that the TSC emergency makeup air filter housing drain discharges to a monitored release pathway; (6) the field check of station filter housing drain configurations; (7) the walkdown of station filter housing drain discharge pipe routing and associated P&ID verification. Open item 454/84-33-01; 454/84-26-01 remains open.

10. Drain Systems for Instrument Racks and for Valve Stem Leak-Off

A cursory review was made concerning a possible lack of hard piping to the radwaste drain system for both instrument racks and valve stem leak-off.

The large number of instrument racks throughout the plant which do not have hard piped drain systems present potential spillage and/or airborne problems from contaminated liquids in the instrument lines. Such problems could occur from performance of surveillance activities, calibrations, venting, draining and removing instruments from service, etc.. Licensee personnel have indicated that present plans involve the use of tygon tubing routed to the radwaste system via a nearby floor or equipment drain or alternately to a container which in turn would be discharged to a radwaste drain. Standard warnings are inserted into procedures to inform the workers that any trapped fluid to be vented may be contaminated and that RAD/CHEM Department procedures should be consulted. Proper worker training and review of work activities should be pursued by the licensee to ensure exposure and contamination problems are minimized for these systems. The Station ALARA Coordinator and the Station Health Physicist have stated that they will ensure that each worker is properly trained in dealing with the radiation hazards of the installed Byron instrument rack drains.

A similar potential for radioactive surface and airborne contamination exists from valve stem leakage, if the leakage is not collected. A number of valve stem leak-off drain pathways in the Chemical and Volume Control and Safety Injection Systems were traced by the inspectors during a Byron plant tour. All valves examined had drain lines which appeared to be properly attached to the valve stems and to be properly routed. A cursory review of the P&IDs for the valve leak-off drain pathways for the Boron Thermal Regeneration, Safety Injection, Residual Heat Removal, and Chemical and Volume Control Systems did not reveal any apparent design problems.

11. Exit Meeting

The inspectors met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on August 1, 1984, and summarized the scope and findings of the inspection activities.